



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,025	11/20/2003	Tomohiro Oshiyama	KOT-0085	8793

7590 10/17/2006

CANTOR COLBURN LLP  
55 Griffin Road South  
Bloomfield, CT 06002

EXAMINER

THOMPSON, CAMIE S

ART UNIT	PAPER NUMBER
----------	--------------

1774

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/718,025

Applicant(s)

OSHIYAMA ET AL.

Examiner

Camie S. Thompson

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on amendment filed July 28, 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 and 43-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-35 and 43-51 is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. Applicant's amendment and accompanying remarks filed July 28, 2006 are acknowledged.
2. Examiner acknowledges amended claims 1, 22, 45 and 47.
3. The objection to claim 22 is withdrawn due to applicant's amended claim 22.
4. The rejection of claim 45 under 35 U.S.C. 112, second paragraph is overcome by applicant's amendment of claim 45.
5. The rejection of claims 1-7 under 35 U.S.C. 102(e) as being anticipated by Suzuri et al., U.S. Patent Number 6,960,364 is overcome by applicant's amendment.
6. The rejection of claims 15-21 under 35 U.S.C. 102(e) as being anticipated by Thoms et al., U.S. Pre Grant Publication 2005/0205696 is withdrawn due to applicant's argument.
7. The rejection of claims 43-51 under 35 U.S.C. 102(e) as being anticipated by Oshiyama et al., U.S. Pre Grant Publication 2003/0198831 is overcome by applicant's declaration submission.

### ***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

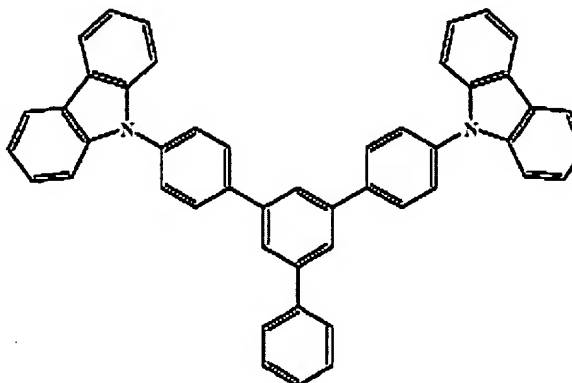
A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 1774

9. Claims 1 and 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Hosokawa, U.S. Patent Number 6,660,410.

Hosokawa discloses an organic electroluminescent element comprising an anode layer, a cathode layer and an organic luminescence layer therebetween wherein the organic luminescence layer comprises a carbazole derivative such as



and a phosphorescent dopant (see column 2, lines 55-68). Column 23, lines 12-55 of the reference discloses that the phosphorescent dopant is a metal complex wherein the metal is selected from Ir, Pt or Os. The reference reads on the instant claims when  $X_1$  of the instant claims is formula (c) and  $n$  is 2 for the instant claims.

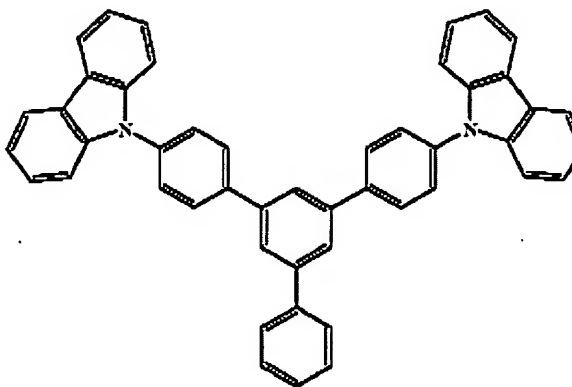
***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosokawa, U.S. Patent Number 6,660,410 in view of Suzuri et al., U.S. Patent Number 6,690,364.

Hosokawa discloses an organic electroluminescent element comprising an anode layer, a cathode layer and an organic luminescence layer therebetween wherein the organic luminescence layer comprises a carbazole derivative such as

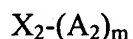


and a phosphorescent dopant (see column 2, lines 55-68). Column 23, lines 12-55 of the reference discloses that the phosphorescent dopant is a metal complex wherein the metal is

Art Unit: 1774

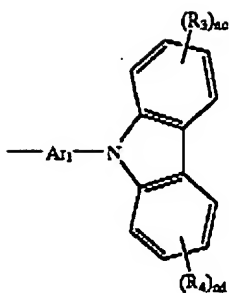
selected from Ir, Pt or Os. The reference reads on the instant claims when  $X_1$  of the instant claims is formula (c) and  $n$  is 2 for the instant claims. Hosokawa does not disclose a hole blocking layer in the device. Suzuri discloses an electroluminescent device comprising a substrate and provided thereon, a light emission layer and at least one layer of a hole injecting layer, a hole transporting layer, an electron injecting layer and an electron transporting layer (see Figures 1&2 and column 5, lines 51-column 6, line 11). Additionally, the reference discloses that the light emission layer comprises a host material comprising a carbazole derivative and phosphorescent dopant such as an iridium complex or platinum complex (see column 6, lines 12-64). The Suzuri reference also discloses that a hole blocking layer can be present and can comprise an oxadiazole derivative (see column 8, lines 49-68 and column 10, lines 1-13). A hole blocking layer increases a recombination probability of electrons. Therefore, it would have been obvious to one of ordinary skill in the art to have a hole blocking layer in Hosokawa reference in order to increase the quantum efficiency of the light emission layer in order to have a device that is highly stable, efficient and has increased luminescence.

12. Claims 8-35 and 43-51 are allowed. The prior art does not provide for an organic electroluminescent element comprising an anode, a cathode and a component layer including a light emission layer, the component layer being provided between the anode and the cathode, wherein the component layer contains a compound represented by formula 3,



wherein  $A_2$  represents a group represented by formula 4, provided that plural  $A_2$  may be the same or different,

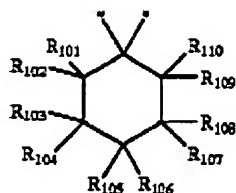
Formula 4



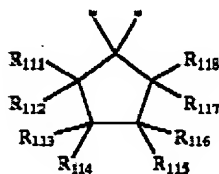
wherein  $\text{Ar}_2$  represents a divalent aromatic hydrocarbon or aromatic heterocyclic group;  $\text{R}_3$  and  $\text{R}_4$  independently represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a cyano group, a hydroxyl group, a substituted or unsubstituted alkenyl group, or a halogen atom;  $n_c$  and  $n_d$  independently represent an integer of from 1 to 4;  $m$  represents an integer of 2; and  $\text{X}_2$  represents a group represented by formula (l), (m), (n), or (o),

Art Unit: 1774

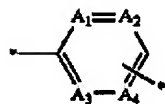
Formula (l)



Formula (m)



Formula (n)



Formula (o)



wherein R<sub>101</sub> and R<sub>110</sub> independently represent a hydrogen atom, an alkyl group, or an alkoxy group, provided that R<sub>101</sub> and R<sub>110</sub> does not simultaneously hydrogen atoms, and any two R<sub>101</sub> and R<sub>110</sub> do not combine with each other to form a ring; R<sub>111</sub> and R<sub>118</sub> independently represent a hydrogen atom, an alkyl group, or an alkoxy group; A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub> and A<sub>4</sub> independently represent -C(R<sub>k1</sub>)= or -N=, in which R<sub>k1</sub> represents a hydrogen atom or an alkyl group, provided that at least one a A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub> and A<sub>4</sub> is -N=; A<sub>5</sub>, A<sub>6</sub>, A<sub>7</sub> and A<sub>8</sub> independently represents -C(R<sub>k2</sub>)= or -N=; X<sub>b</sub> represents -N(R<sub>k3</sub>)= or -Si(R<sub>k4</sub>)(R<sub>k5</sub>)-, which R<sub>k2-k5</sub> independently represent a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group,

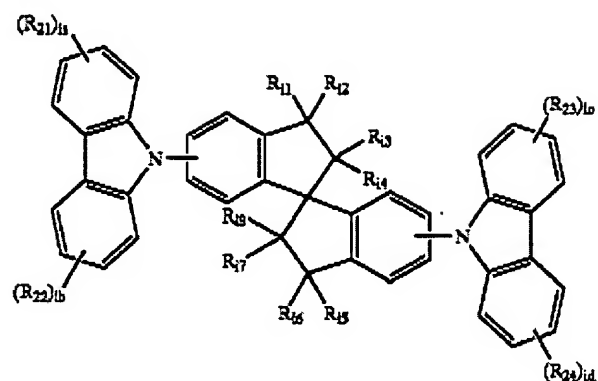


Art Unit: 1774

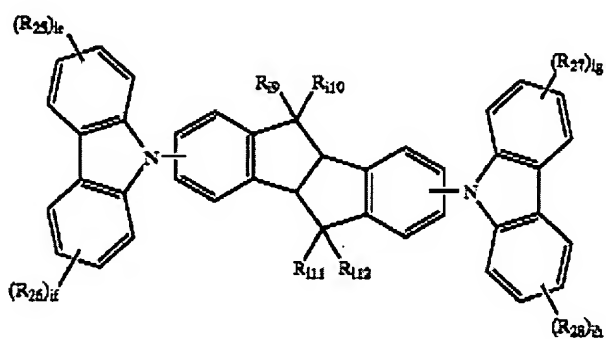
a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a cyano group, a hydroxyl group, a substituted or unsubstituted alkenyl group, or a halogen atom; and “\*” represents a linkage site.

The prior art does not provide for an organic electroluminescent element comprising an anode, a cathode and a component layer including a light emission layer, the component layer being provided between the anode and the cathode, wherein the component layer contains a compound represent by formulae I1, I2, I3, J1 or J2

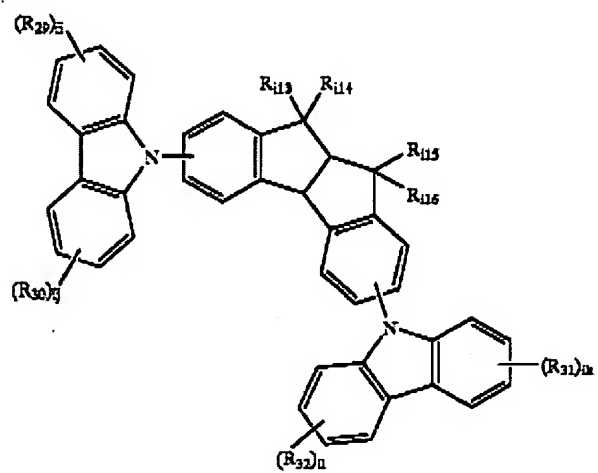
Art Unit: 1774



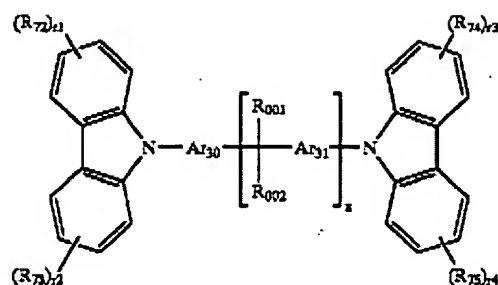
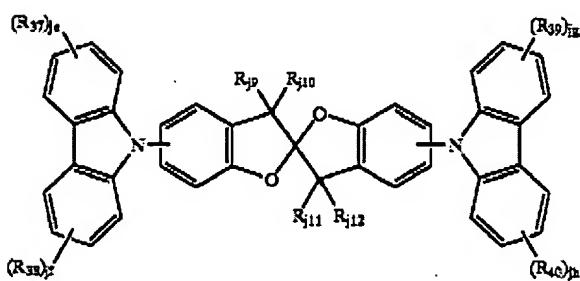
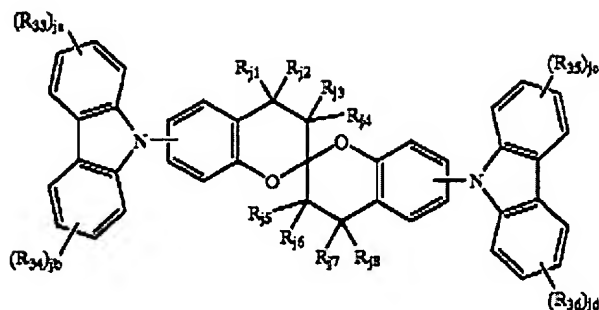
[0066] Formula I2



[0067] Formula I3



Art Unit: 1774



wherein  $R_{11-116}$  independently represent a hydrogen atom, an alkyl group, a cycloalkyl group, an aralkyl group, an alkoxy group or a halogen atom;  $R_{21-32}$  independently represent a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a cyano group, a hydroxyl group, a substituted or unsubstituted alkenyl group, or a halogen atom; and  $i$  and  $j$  independently represent an integer of from 1 to 4;  $R_{j1-j12}$  independently represents a hydrogen atom, an alkyl group, a cycloalkyl group, an aralkyl group, an alkoxy group or a halogen atom;  $R_{33-40}$  independently represent a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aryl group, a

Art Unit: 1774


substituted or unsubstituted aralkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a cyano group, a hydroxyl group, a substituted or unsubstituted alkenyl group, or halogen atom; and ja-jh independently represent an integer of from 1 to 4.

***Response to Arguments***

13. Applicant's arguments with respect to the instant claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (571) 272-1530. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena L Dye, can be reached at (571) 272-3186. The fax phone number for the Group is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
RENA DYE  
SUPERVISORY PATENT EXAMINER  
Art Unit 1774  
12/1-4